

No.

200000301

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Arizona Plant Breeders, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY, AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR PLANT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED, (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS, (84 STAT. 1542, 7 U.S.C. 2321 ET SEQ.)

WHEAT, DURUM

'MATT'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-fifth day of September, in the year two thousand and three.

Attest:

Thomas A. Salt

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Am. Freeman

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426)

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

1. NAME OF OWNER Arizona Plant Breeders, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME D95-434		3. VARIETY NAME MATT	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) P.O. Box 5985 9343 W. Battaglia Rd. Arizona City, AZ 85223		5. TELEPHONE (include area code) 520-466-6552		FOR OFFICIAL USE ONLY VPO NUMBER 00003017	
6. FAX (include area code) 520-466-6584		7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		8. IF INCORPORATED, GIVE STATE OF INCORPORATION Montana	
9. DATE OF INCORPORATION 1-18-89		10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Albert E. Carleton Ward M. Orcutt P.O. Box 5985 Arizona City, AZ 85223		FILING AND EXAMINATION FEES: \$2450.00 DATE 7-12-00 CERTIFICATION FEE: \$432.00 DATE 9/8/03	
11. TELEPHONE (include area code) 520-466-6552		12. FAX (include area code) 520-466-6584		13. E-MAIL apb@theriver.com	
14. CROP KIND (Common Name) Durum		15. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)			
16. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no," go to item 22)		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED			
21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1, 2, 3, etc. <input checked="" type="checkbox"/> 1 FOUNDATION <input checked="" type="checkbox"/> 1 REGISTERED <input checked="" type="checkbox"/> 1 CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse)		22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER 			
NAME (Please print or type) Albert E. Carleton		NAME (Please print or type) Ward M. Orcutt			
CAPACITY OR TITLE President		DATE 7/3/2000		CAPACITY OR TITLE Vice President	
DATE 7/3/00		DATE 7/3/00			

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,450 (\$300 filing fee and \$2,150 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

N/A

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

N/A

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center—East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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ST-470 (6-98) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete

18a Exhibit A**Origin and Breeding History of MATT Durum**

In 1993, in Arizona the varieties Cortez and Aruba were used as alpha parents and 100 crossed from each variety was made into the AZ MSFRS-86 quality enhanced spring durum wheat germplasm released by the University of Arizona.

The F1 block of all crosses grown in Montana during the summer of 1993 without selection. The F2 generation was obtained by harvesting the entire F1 plot.

The F2 population was seeded in the fall of 1994 at a seeding rate of five pounds per acre for individual plant selection. 'Matt' was derived by Arizona Plant Breeders, Inc., from a single F2 head, which was selected at random, in the spring of 1995. The selections were not made for any characteristics other than to advance to the next generation.

The F2 heads were used to plant F3 head rows during the summer of 1995 in Montana. Four heads were selected at random from each F3 row to advance to the F4 generation. The F4 plots, consisting of the four randomly selected F3 heads, were planted in the fall of 1995 in Arizona.

The F4 plots seeded in the fall of 1995 were evaluated for plant height, heading date, sterility, 1000 kernel weight, grain protein and sedimentary test scores. Selection was based on acceptable values for each of the above characteristics. F4 plots that did not score well were eliminated from the program. The F4 line designated D95-434 (Matt) scored very high for these selection characteristics and was advanced to the next generation by selecting 24 heads from one F4 head row to be seeded in the spring of 1996 in Montana for the F5 generation.

Fourteen (14) uniform F5 head rows, selected for plant height and maturity, which also did not segregate for male sterility, were harvested and bulked to form the F6 generation. This F6 generation was used for testing in yield trials and to produce a bulk increase to the F7 generation in Arizona during the fall of 1996. No selection was made during this advancement to the F7 generation.

One hundred (100) heads were selected at random from the F7 bulk in Arizona in the spring of 1998 and grown as F8 head rows in Montana during the summer of 1998. A total of 96 of these head rows, which did not segregate for heading date, plant height, sterility or awn color, were selected to produce a bulk of the F8 generation. This bulk of

uniform head rows was used to establish fields in California and Arizona to produce the F9 generation, which was designated as Breeders Seed of the variety 'Matt'.

Matt is a stable and uniform variety in agronomic appearance and performance. Agronomic data to support uniformity has been observed for four generations, as shown in Tables 1 and 2, where the next generation was used for each years testing.

No variant has been observed in 'Matt' after head-rowing in 1998.

Table 1
A Comparison of Matt, Kronos and Ocotillo in Arizona Plant Breeders
Yield Trials at Two Locations
For Four Years

<u>ARIZONA</u>				<u>CALIFORNIA</u>		
<u>Year</u>	<u>Heading</u>	<u>Plant Height</u>	<u>Yield</u>	<u>Heading</u>	<u>Plant Height</u>	<u>Yield</u>
<u>1996-1997</u>	<u>Date</u>	<u>In Inches</u>	<u>LB/A</u>	<u>Date</u>	<u>In Inches</u>	<u>LB/A</u>
Matt	22-Mar	36"	6,969	20-Mar	38"	8,120
Kronos	20-Mar	34"	6,969	18-Mar	35"	7,076
Ocotillo	<u>28-Mar</u>	<u>38"</u>	<u>6,174</u>	<u>25-Mar</u>	<u>37"</u>	<u>6,935</u>
	LSD .05 =	3.8"	535lb/a	LSD .05 =	4.5"	642lb/a
<u>Year</u>						
<u>1997-1998</u>						
Matt	26-Mar	39"	6,235	17-Mar	36"	6,815
Kronos	26-Mar	35"	6,416	12-Mar	36"	8,011
Ocotillo	<u>02-Apr</u>	<u>38"</u>	<u>6,344</u>	<u>24-Mar</u>	<u>40"</u>	<u>6,723</u>
	LSD .05 =	2.9"	371lb/a	LSD .05 =	3.4"	389lb/a
<u>Year</u>						
<u>1998-1999</u>						
Matt	01-Apr	34"	5,220			
Kronos	26-Mar	33"	5,330		No Data	
Ocotillo	<u>06-Apr</u>	<u>36"</u>	<u>4,785</u>		Lost Nursery	
	LSD .05 =	2.3"	495lb/a			
<u>Year</u>						
<u>1999-2000</u>						
Matt	20-Mar	38"	6,788	17-Mar	38"	6,133
Kronos	18-Mar	35"	7,502	16-Mar	36"	6,716
Ocotillo	<u>26-Mar</u>	<u>40"</u>	<u>6,788</u>	<u>23-Mar</u>	<u>40"</u>	<u>7,006</u>
	LSD .05 =	3.2"	612lb/a	LSD .05 =	3.7"	618lb/a

Table 2
A Comparison of Matt, Kronos and Ocotillo
In Public Trials at Five Locations
For Two Years

200000301

UC Davis 1998

UC Davis 1999

<u>Variety</u>	<u>Heading Date</u>	<u>Plant Height In Inches</u>	<u>Yield LB/A</u>	<u>Heading Date</u>	<u>Plant Height In Inches</u>	<u>Yield LB/A</u>
Matt	02-Apr	39"	4,720	14-Apr	43"	5,710
Kronos	01-Apr	38"	5,170	13-Apr	40"	6,090
Ocotillo	07-Apr	43"	4,880	*	*	*
LSD .05 =	3 days	2.0"	870lb/a	1 day	2.0"	600lb/a

Modera 1998

Modera 1999

Matt	*	38"	5,020	*	35"	3,600
Kronos	*	40"	5,050	*	34"	4,590
Ocotillo	*	36"	3,810	*	*	*
LSD .05 =	*	*	750lb/a	*	3.0"	*

Kings Co. 1998

Kings Co. 1999

Matt	*	39"	4,670	*	44"	7,250
Kronos	*	37"	4,350	*	40"	8,280
Ocotillo	*	41"	4,660	*	*	*
LSD .05 =	*	*	430lb/a	*	2.0"	490lb/a

Kern 1998

Kern 1999

Matt	*	39"	3,920	*	41"	7,110
Kronos	*	37"	3,280	*	38"	6,840
Ocotillo	*	41"	3,670	*	*	*
LSD .05 =		n/s	550lb/a		3.0"	800lb/a

Imperial 1998

Imperial 1999

Matt	16-Mar	39"	7,930	12-Mar	35"	7,940
Kronos	13-Mar	37"	8,270	15-Mar	32"	8,310
Ocotillo	17-Mar	42"	7,400	*	*	*
LSD .05 =	1 day	1.0"	320lb/a	2 days	1.0"	510lb/a

18b Statement of Distinctiveness

Matt is a semi-dwarf, white-awned and white chaff durum variety. Matt is most similar in phenotypic appearance to the varieties Kronos and Ocotillo. The average awn lengths for Matt, Kronos and Ocotillo were 13.5, 14.5 and 16.5cm respectively (see Table 3). Rachis internode lengths for Matt, Kronos and Ocotillo were 5.1, 6.2 and 7.3mm respectively (see Table 4). Head lengths were 9.2, 7.8 and 11.3cm for Matt, Kronos and Ocotillo (see Table 5). Plant height for Matt, Kronos and Ocotillo were 97.4, 92.2 and 96.9cm respectively (see Table 6). Matt can be distinguished from Kronos by being taller, having shorter awns, shorter rachis internodes, but longer heads (more florets per spike). Matt can be distinguished from Ocotillo by having much shorter awns, rachis internodes and heads.

Table 3
Average Awn Length for Matt, Kronos and Ocotillo
Measured on 100 Plants
When Grown in Arizona and Montana in 1998

<u>Awn Length in cm.</u>			
<u>Variety</u>	<u>Arizona</u>	<u>Montana</u>	<u>Mean</u>
Matt	14.1	12.7	13.4
Kronos	14.7	14.3	14.5
Ocotillo	16.8	16.2	16.5

Matt vs Kronos $t = 1.723$ sign. at .05 level

Matt vs Ocotillo $t = 6.435$ sign. at .05 level

Table 4
Average Rachis Internode Length for Matt, Kronos and Ocotillo
Measured on 100 Plants
When Grown in Arizona and Montana in 1998

<u>Rachis Internode Length in mm.</u>			
<u>Variety</u>	<u>Arizona</u>	<u>Montana</u>	<u>Mean</u>
Matt	5.2	5.0	5.1
Kronos	6.4	6.0	6.2
Ocotillo	7.3	7.3	7.3

Matt vs Kronos $t = 1.365$ sign. at .05 level

Matt vs Ocotillo $t = 2.114$ sign. at .05 level

Table 5
Head Length for Matt, Kronos and Ocotillo
Measured on 100 Plants
When Grown in Arizona and Montana in 1998

<u>Head Length in cm.</u>			
<u>Variety</u>	<u>Arizona</u>	<u>Montana</u>	<u>Mean</u>
Matt	9.7	8.7	9.2
Kronos	7.9	7.7	7.8
Ocotillo	11.5	10.8	11.3

Matt vs Kronos $t = 2.317$ sign. at .02 level

Matt vs Ocotillo $t = 3.625$ sign. at .01 level

Table 6
Plant Height for Matt, Kronos and Ocotillo
Measured on 100 Plants
Grown in Arizona in 1999

<u>Variety</u>	<u>Average Plant Height</u> <u>in centimeters</u>
Matt	97.4
Kronos	92.2
Ocotillo	69.9

Matt vs Kronos $t = 2.672$ at sign .01 level

Matt vs Ocotillo $t = 1.521$ sign at .10 level

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

EXHIBIT C
(Wheat)

**OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)**

NAME OF APPLICANT(S) Arizona Plant Breeders, Inc.	FOR OFFICIAL USE ONLY
	PVPO NUMBER
	VARIETY NAME
	TEMPORARY OR EXPERIMENTAL DESIGNATION

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____
Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

1=Common

2=Durum

3=Club

4=Other (SPECIFY): _____

2. VERNALIZATION:

1=Spring

2=Winter

3=Other (SPECIFY): _____

3. COLEOPTILE ANTHOCYANIN:

1=Absent

2=Present

4. JUVENILE PLANT GROWTH:

1=Prostrate

2=Semi-erect

3=Erect

5. PLANT COLOR (boot stage):

1 = Yellow-Green

2 = Green

3 = Blue-Green

6. FLAG LEAF (boot stage):

1 = Erect

2 = Recurved

1 = Not Twisted

2 = Twisted

7. EAR EMERGENCE:

Number of Days Earlier Than 881

Number of Days Later Than Kronos

8. ANTHOR COLOR:

1 = Yellow

2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

cm Taller Than Kronoscm Shorter Than None

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

1 = Absent

2 = Present

B. WAXY BLOOM

1 = Absent

2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent

2 = Present

D. INTERNODE (SPECIFY NUMBER)

1 = Hollow

2 = Semi-solid

3 = Solid

E. PEDUNCLE

1 = Absent

2 = Present

cm Length

11. HEAD (at Maturity):

A. DENSITY

1 = Lax

2 = Middense

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (SPECIFY): _____

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES (at Maturity):

A. COLOR

1 = White

2 = Tan

3 = Other (SPECIFY): _____

C. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

D. LENGTH

1 = Short

2 = Medium

(ca. 7mm)

(ca. 8mm)

3 = Long (ca. 9mm)

12. GLUMES (at Maturity) *Continued*:

2000003011

E. WIDTH

☒ 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm)
3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

☒ 1 = Ovate 2 = Oval 3 = Elliptical

C. BRUSH

☒ 1 = Short 2 = Medium 3 = Long

☒ 1 = Not Collared 2 = Collared

B. CHEEK

☒ 1 = Rounded 2 = Angular

D. CREASE

☒ 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

☒ 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

☒ 1 = White 2 = Amber 3 = Red
4 = OTHER (Specify)

G. PHENOL REACTION (*see instructions*):

☐ 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

☒ 1 = Hard 2 = Soft

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

☒ 0 Stem Rust (*Puccinia graminis* f. sp. *tritici*)

☒ 3 Leaf Rust (*Puccinia recondita* f. sp. *tritici*)

☒ 2 Stripe Rust (*Puccinia striiformis*)

☒ 1 Loose Smut (*Ustilago tritici*)

☒ 2 Tan Spot (*Pyrenophora tritici-repentis*)

☒ 0 Flag Smut (*Urocystis agropyri*)

☒ 0 Halo Spot (*Selenophoma donacis*)

☒ 0 Common Bunt (*Tilletia tritici* or *T. laevis*)

☒ 3 *Septoria nodorum* (Glume Blotch)

☒ 0 Dwarf Bunt (*Tilletia controversa*)

☒ 0 *Septoria avenae* (Speckled Leaf Disease)

☒ 0 Karnal Bunt (*Tilletia indica*)

☒ 0 *Septoria tritici* (Speckled Leaf Blotch)

☒ 3 Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)

☒ 1 Scab (*Fusarium* spp.)

☒ 0 "Snow Molds"

200000301
14. Disease (Continued) (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

- | | |
|--|--|
| <input checked="" type="checkbox"/> 3 "Black Point" (Kernel Smudge) | <input checked="" type="checkbox"/> 1 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input checked="" type="checkbox"/> 2 Barley Yellow Dwarf Virus (BYDV) | <input type="checkbox"/> 0 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input type="checkbox"/> 0 Soilborne Mosaic Virus (SBMV) | <input checked="" type="checkbox"/> 1 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input type="checkbox"/> 0 Wheat Yellow (Spindle Streak) Mosaic Virus | <input checked="" type="checkbox"/> 2 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input type="checkbox"/> 0 Wheat Streak Mosaic Virus (WSMV) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |
| <input type="checkbox"/> Other (SPECIFY) | <input type="checkbox"/> Other (SPECIFY) |

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

- | | |
|---|--|
| <input checked="" type="checkbox"/> 1 Hessian Fly (<i>Mayetiola destructor</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 4 Stem Sawfly (<i>Cephus</i> spp.) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Cereal Leaf Beetle (<i>Oulema melanopa</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Russian Aphid (<i>Diuraphis noxia</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Greenbug (<i>Schizaphis graminum</i>) | <input type="checkbox"/> Other (SPECIFY) |
| <input checked="" type="checkbox"/> 1 Aphids | <input type="checkbox"/> Other (SPECIFY) |

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

18d **Additional Description of the Variety**

The pasta quality properties for Matt clearly indicate a superiority over most durum varieties and more particularly the variety Kronos (see Tables 7, 8 and 9).

Table 7

Quality of Matt and Kronos
From 1997 Yield Trials by APB
At Casa Grande, AZ & El Centro, CA
(Done by California Wheat Commission Lab)

Location: Casa Grande, AZ (1997)

<u>Entry</u>	<u>Grain Protein</u>	<u>Grain Ash</u>	<u>HVAC</u>	<u>Total Ext.</u>	<u>Semo. Protein</u>	<u>Semo. Ash</u>	<u>W</u>	<u>Semo. Color</u>	<u>Firmness</u>
Kronos	13.9	1.51	99	72.8	12.2	0.64	181	10	7.0
Matt	14.1	1.43	100	78.2	12.9	0.62	187	10	8.8

Location: El Centro, CA (1997)

<u>Entry</u>	<u>Grain Protein</u>	<u>Grain Ash</u>	<u>HVAC</u>	<u>Total Ext.</u>	<u>Semo. Protein</u>	<u>Semo. Ash</u>	<u>W</u>	<u>Semo. Color</u>	<u>Firmness</u>
Kronos	13.3	2.00	99	74.4	12.2	0.84	207	9.0	7.4
Matt	14.3	1.96	99	71.0	12.8	0.75	280	10.0	8.0

Table 8

Quality of Matt and Kronos from
1998 Yield Trials by APB at Casa Grande, AZ & El Centro, CA
(Done by California Wheat Commission Lab)

Location: Casa Grande, AZ (1998)

<u>Entry</u>	<u>Grain</u>		<u>Total</u>	<u>Semo.</u>		<u>W</u>	<u>Semo.</u>	
	<u>Protein</u>	<u>Ash</u>	<u>Ext.</u>	<u>Protein</u>	<u>Ash</u>		<u>Color</u>	<u>Firmness</u>
Kronos	13.5	1.61	77	12.4	0.71	138	10	7.4
Matt	14.2	1.79	77	12.6	0.61	195	10	8.4

Location: El Centro, CA (1998)

<u>Entry</u>	<u>Grain</u>		<u>Total</u>	<u>Semo.</u>		<u>W</u>	<u>Semo.</u>	
	<u>Protein</u>	<u>Ash</u>	<u>Ext.</u>	<u>Protein</u>	<u>Ash</u>		<u>Color</u>	<u>Firmness</u>
Kronos	14.7	1.94	74	13.2	0.68	242	8.5	7.6
Matt	14.9	1.97	80	13.9	0.61	295	9.0	9.2

Table 9

Quality of Matt and Kronos
from 1998 Kings County, UCD Trial
(Done by California Wheat Commission Lab)

<u>Entry</u>	<u>Grain Protein</u>	<u>Grain Ash</u>	<u>HVAC</u>	<u>Total Ext.</u>	<u>Semo. Protein</u>	<u>Semo. Ash</u>	<u>W</u>	<u>Semo. Color</u>	<u>Firmness</u>
Kronos	13.9	1.70	98	70	12.8	0.91	158	7.5	7.7
Matt	12.8	1.69	99	73	11.6	0.52	227	9.5	8.3

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP*The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.**Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2428).*

1. NAME OF APPLICANT(S) Arizona Plant Breeders, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER D95-434	3. VARIETY NAME MATT
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) P. O. Box 5985 9343 W. Battaglia Rd. Arizona City, AZ 85223		5. TELEPHONE (include area code) 520-466-6552	6. FAX (include area code) 520-466-6584
		7. PVPO NUMBER 2000000301	
8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
9. Is the applicant (individual or company) a U.S. national or U.S. based company? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country			
10. Is the applicant the original owner? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, please answer <u>one</u> of the following:			
a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country			
b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country			
11. Additional explanation on ownership (if needed, use reverse for extra space): N/A			

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

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